

REMARKS

Claims 1-35 are pending. Independent claims 1, 9, 17, and 25-27 have been amended. Reexamination and reconsideration of this application are respectfully requested.

In the August 29, 2001 Office Action, the Examiner rejected claims 1-35. The Examiner rejected claims 1-3, 5-6, 9-13, 17-21, and 25-35 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,504,270 to Sethares. Claims 4, 7-8, 14-16, and 23-24 were rejected under 35 U.S.C. §103(a) as obvious over Sethares in view of Official Notice. These rejections are respectfully traversed.

The present invention is directed to an apparatus for converting an input voice signal into an output voice signal according to a reference voice signal. Extracting means extract a plurality of sinusoidal wave components from the input voice signal, where the sinusoidal wave components are spectral wave components of the input voice and are in the form of at least frequency value coordinates. A plurality of frames having spectrum data are created from the input voice signal, and corresponding peak values of the spectrum data in the frames are used to determine the spectral wave components. Memory means memorize reference pitch information representative of a pitch of the reference voice signal. Modulating means modulate the frequency value coordinates of the sinusoidal wave components of the input voice signal according to the reference pitch information retrieved from the memory means. Mixing means mix the plurality of the sinusoidal wave components having the modulated frequency value coordinates to synthesize the output voice signal, where the output voice signal has a pitch different from that of the input voice signal and is influenced by that of the

reference voice signal.

In the August 29, 2001 Office Action, the Examiner rejected claims 1-3, 5-6, 9-13, 17-21, and 25-35 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,504,270 to Sethares. The Examiner stated that Sethares teaches an analyzer device that analyzes components in an input voice signal, Fast Fourier Transform (FFT) analysis, deriving a parameter set of an original frequency and original amplitude, sinusoidal wave components and frequency and amplitude coordinates, memory means to store amplitude and pitch information, and modulating means to modulate frequency according to pitch information from the memory means.

Independent claim 1, as thrice amended, recites: “[a]n apparatus for converting an input voice signal into an output voice signal according to a reference voice signal, the apparatus comprising: extracting means for extracting a plurality of sinusoidal wave components from the input voice signal, the sinusoidal wave components being spectral wave components of the input voice and in the form of at least frequency value coordinates, wherein a *plurality of frames having spectrum data are created from the input voice signal, and corresponding peak values of the spectrum data in the frames are used to determine the spectral wave components*”. (Emphasis added.)

Sethares teaches a method an apparatus for receiving an electronic audio input signal having at least one partial, or overtone, evaluating the dissonance of the input signal relative to a set of reference partials, and for producing an output signal having a larger or smaller dissonance than the input signal. (Col. 2, lines 12-17.) Sethares discloses using a “real time analyzer to calculate the spectrum of partials of [a] signal using FFT”. (Col. 5, lines 25-28.) The input signal can then be altered by shifting “one

or more of the input partials so that they have more desirable dissonance characteristics." (Col. 7, lines 13-16.) However, Sethares does not teach, suggest, or disclose the use of a plurality of frames of frequency data created from an input voice signal, and **corresponding peak values of the spectrum data in the frames are used to determine the spectral wave components** of the input voice signal.

Sethares, on the other hand, does not disclose any such use of peak values.

Determining and using the peak values of the frequency data is not an insubstantial difference – in fact, using such a method results in much more accurate frequency data because only the corresponding peak values are utilized to determine the spectral wave components. Therefore, peak values that do not correspond to peak values in other frames are not utilized to determine such spectral components.

Accordingly, Applicants submit that independent claim 1, as amended, distinguishes over Sethares. Claims 2-3, 5-6, and 30 all depend, directly, or indirectly from independent claim 1, as thrice amended. Independent claims 9, 17, and 25-27, each as thrice amended, each contain limitations similar to those in independent claim 1. Claims 10-13 and 31 all depend, directly or indirectly, from independent claim 9, as thrice amended. Claims 18-22, 28, and 32 all depend, directly or indirectly, from independent claim 17, as thrice amended. Claim 33 directly depends from independent claim 25, as thrice amended. Claim 34 directly depends from independent claim 26, as thrice amended. And claims 29 and 35 directly depend from independent claim 27, as thrice amended. Therefore, it is respectfully submitted that the rejection of claims 1-3, 5-6, 9-13, 17-21, and 25-35 under 35 U.S.C. §102(b) should be withdrawn.

The Examiner rejected claims 4, 7-8, 14-16, and 23-24 under 35 U.S.C. §103(a)

as being obvious over Sethares in view of Official Notice. The Examiner stated that Sethares teaches "detecting a pitch of the input signal based on results of extraction". The Examiner took Official Notice that it would have been obvious to (a) output an original signal in situations where a pitch is not detected from the input signal to avoid large fluctuations in the pitch of the signal, and (b) modify the system of Sethares to adjust the volume level of the output signal to match the volume level of the target or reference signal. Claims 4 and 7-8 directly depend from independent claim 1, as thrice amended, and distinguish over Sethares for the same reasons as those set forth above with respect to independent claim 1, as thrice amended. Claims 14-16 directly depend from independent claim 9, as thrice amended, and distinguish over Sethares for the same reasons as those set forth above with respect to independent claim 9, as thrice amended. Claims 23-24 depend directly from independent claim 17, as thrice amended, and distinguish over Sethares for the same reasons as those set forth above with respect to independent claim 17, as thrice amended. The combination of the Examiner's Official Notice and Sethares does not teach, disclose, or suggest the use of a plurality of frames of frequency data created from an input voice signal, and **corresponding peak values of the spectrum data in the frames are used to determine the spectral wave components** of the input voice signal. Accordingly, Applicants submit that claims 4, 7-8, 14-16, and 23-24 distinguish over a combination of Sethares and Official Notice. Therefore, it is respectfully submitted that the rejection of claims 4, 7-8, 14-16, and 23-24 under 35 U.S.C. §103(a) should be withdrawn.

Applicants believe that the foregoing amendments place the application in condition for allowance, and a favorable action is respectfully requested. If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call either of the undersigned attorneys at the Los Angeles telephone number (213) 488-7100 to discuss the steps necessary for placing the application in condition for allowance should the Examiner believe that such a telephone conference would advance prosecution of the application.

Respectfully submitted,

PILLSBURY WINTHROP LLP

Date: January 29, 2002

By: James M. Wakely
James M. Wakely
Registration No. 48,597
Attorney For Applicants

Date: January 29, 2002

By: Roger R. Wise
Roger R. Wise
Registration No. 31,204
Attorney For Applicants

725 South Figueroa Street, Suite 2800
Los Angeles, CA 90017-5406
Telephone: (213) 488-7100
Facsimile: (213) 629-1033